Exam Date & Time: 13-Jul-2022 (09:00 AM - 12:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH MAKE UP END SEMESTER EXAMINATIONS, JULY 2022

AUTOTRONICS [AAE 4040]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Missing data may be suitably assumed

1) With suitable sketch, explain the functions and features of Hall Effect sensor and identify any one application of Hall Effect sensor in automotive field. (4)

A)

B) Explain the application of strain gauges in measuring mass flow rate of air in an IC engine. (2)

C) Explain the principle of Oxygen sensors and with necessary sketch show the application of theses sensors in maintaining air fuel ratio. (4)

2) With necessary sketch, explain the working of permanent magnet stepper motor. (2)

A)

B) With neat sketch explain the working of brushless DC motor and identify the applications of the same in automotive industry. (4)

C) Explain the principle of linear variable displacement transducer in measuring the displacement. Explain with the help of suitable example. (4)

3) Explain the importance of thermos time switch in fuel injection system of a vehicle. (3)

A)

B) Explain the features and working of ignition coil of a vehicle ignition system. (3)

C) Sketch simple layout of a Bosch Motronic Fuel injection system and identify the main sensors incorporated in the system. (4)

4) Identify the components of distributor less ignition system and with suitable sketch (3)

explain the working of the same.

A)

B) Sketch the layout of active suspension system and illustrate the features of the system. (3)

C) With suitable block diagram, explain the chemical reaction involved in the process of generation of cell voltage in a lead acid batteries. (4)

5) With necessary diagrams, explain the working of gas discharge lamps used in vehicle lighting system. (3)

A)

B) With suitable sketch, explain the features and function of a starter motor of a vehicle. (3)

C) With suitable block diagram explain the working of a typical cruise control module used in a vehicle. (4)

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